

Appl. No. 10/711,790
Amtd. dated August 15, 2006
Reply to Office action of May 16, 2006

Amendments to the Drawings:

The attached sheet of drawings includes a copy of Figures 1 and 2. As requested by the examiner, empty pages of the drawings have been removed. Figures 1 and 2 have 5 been resubmitted.

Attachment: Replacement Sheet 2 pages

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REMARKS/ARGUMENTS

Rejection of Claims 1-3, 6, 8, 9, 14, 17, 19, 20 under 35 U.S.C. 101 as claiming the same invention as that of claims 1-3, 5, 8, 9, 10, 15, and 16 of copending Application

5 **Publication No. 2005/0110148.**

Claims 1-3, 6, 8, 9, 14, 17, 19, 20 have been amended to overcome this rejection. Applicant asserts that the claims 1-3, 6, 8, 9, 14, 17, 19, 20 of the instant application are now different from the claims 1-3, 5, 8, 9, 10, 15, and 16 of the copending application.

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Rejection of Claims 4, 5, 7, 15, 16, 18, 25-31, 36-42, and 47-53 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 6, 11, 13, 17-20, 22-27, 29, and 30 of copending Application Publication No.

15 **2005/0110148.**

A terminal disclaimer in compliance with 37 CFR 1.321(c) is attached to overcome this rejection. Reconsideration of claims 4, 5, 7, 15, 16, 18, 25-31, 36-42, and 47-53 is respectfully requested.

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Rejection of Claims 1-5, 7-16 and 18-24 under 35 U.S.C 102(b/e) as being anticipated by admitted prior art.

25 Claim 1 has been amended to overcome this rejection. The amended claim 1 recites a metal layer structure having a substrate, a first dielectric layer disposed on the substrate, at least a metal structure disposed in the first dielectric layer, a second dielectric

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layer disposed on the first dielectric layer and the metal structure, at least a first conductor and a second conductor disposed on the first dielectric layer, and at least a conductive plug disposed in the second dielectric layer for connecting the first conductor, the second conductor and the metal structure. Preferably, the second conductor includes at least one thin portion.

Despite the fact that the prior art of the claimed invention discloses a metal layer structure having a first dielectric layer formed on a substrate and at least a first conductor and a second conductor disposed on the first dielectric layer, the prior art does not teach a conductive plug formed in a second dielectric layer for connecting the first conductor, the second conductor, and the metal structure. Since the conductive plug structure is absent in the prior art, applicant asserts that the metal layer structure disclosed by the prior art of the claimed invention is significantly different from the metal layer structure of the claimed invention. Reconsideration of the amended claim 1 is therefore politely requested. As claims 2-5 and 7-13 are dependent upon the amended claim 1, applicant asserts that if claim 1 is found allowable, claims 2-5 and 7-13 should additionally be found allowable. Reconsideration of the claims 2-5 and 7-13 is politely requested.

Claim 14 has been amended to overcome this rejection. The amended claim 14 recites a metal layer structure having a substrate, a first dielectric layer disposed on the substrate, at least a metal structure disposed in the first dielectric layer, a second dielectric layer disposed on the first dielectric layer and the metal structure, at least a first conductor and a second conductor disposed on the first dielectric layer, and at least a conductive plug disposed in the second dielectric layer for connecting the second conductor and the metal structure. Preferably, the first conductor and the second conductor include a first thickness and a second thickness respectively and the first thickness and the second thickness impart different functions to the first conductor and the second conductor.

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Despite the fact that the prior art of the claimed invention discloses a metal layer structure having a first dielectric layer formed on a substrate and at least a first conductor and a second conductor disposed on the first dielectric layer, the prior art does not teach a conductive plug formed in a second dielectric layer for connecting the first conductor, the 5 second conductor, and the metal structure. Since the conductive plug structure is absent in the prior art, applicant asserts that the metal layer structure disclosed by the prior art of the claimed invention is significantly different from the metal layer structure of the claimed invention. Reconsideration of the amended claim 14 is therefore politely requested. As claims 15-16 and 18-24 are dependent upon the amended claim 14, 10 applicant asserts that if claim 14 is found allowable, claims 15-16 and 18-24 should additionally be found allowable. Reconsideration of the claims 15-16 and 18-24 is politely requested.

15 **Rejection of Claims 1-57 under 35 U.S.C 102(b) as being anticipated by Lee et al. (US 6175145).**

Applicant asserts that Lee et al do not teach a metal layer structure as per the limitation disclosed in claim 1 of the claimed invention. The amended claim 1 recites a 20 metal layer structure having a substrate, a first dielectric layer disposed on the substrate, at least a metal structure disposed in the first dielectric layer, a second dielectric layer disposed on the first dielectric layer and the metal structure, at least a first conductor and a second conductor disposed on the first dielectric layer, and at least a conductive plug disposed in the second dielectric layer for connecting the first conductor, the second 25 conductor and the metal structure. Preferably, the second conductor includes at least one thin portion.

In contrast to the claimed invention, the metal layer structure disclosed by Lee et al

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does not include a conductive plug for connecting a fuse metal and a metal structure, such as a metal line. Inspection of Fig. 5C of Lee et al will reveal that the fuse metal pattern 50 is formed simultaneously with the adjacent via contacts 20, and no conductive plug is formed below the fuse metal 50 and within the insulating layer 15 for connecting the fuse 5 metal pattern 50 and the metal 10. Hence, applicant asserts that the metal layer structure disclosed by Lee et al is significantly different from the metal layer structure of the claimed invention. Reconsideration of the amended claim 1 is therefore politely requested. As claims 2-13 are dependent upon the amended claim 1, applicant asserts that if claim 1 is found allowable, claims 2-13 should additionally be found allowable.

10 Reconsideration of the claims 2-13 is politely requested.

Applicant asserts that Lee et al do not teach a metal layer structure as per the limitation disclosed in claim 14 of the claimed invention. The amended claim 14 recites a metal layer structure having a substrate, a first dielectric layer disposed on the substrate, 15 at least a metal structure disposed in the first dielectric layer, a second dielectric layer disposed on the first dielectric layer and the metal structure, at least a first conductor and a second conductor disposed on the first dielectric layer, and at least a conductive plug disposed in the second dielectric layer for connecting the second conductor and the metal structure. Preferably, the first conductor and the second conductor include a first 20 thickness and a second thickness respectively and the first thickness and the second thickness impart different functions to the first conductor and the second conductor.

Similar to the arguments made for claim 1, the metal layer structure disclosed by Lee et al does not include a conductive plug for connecting a fuse metal and a metal structure, such as a metal line. Inspection of Fig. 5C of Lee et al will reveal that the fuse metal pattern 50 is formed simultaneously with the adjacent via contacts 20, and no conductive plug is formed below the fuse metal 50 and within the insulating layer 15 for connecting the fuse metal pattern 50 and the metal 10. Hence, applicant asserts that the metal layer

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structure disclosed by Lee et al is significantly different from the metal layer structure of the claimed invention. Reconsideration of the amended claim 14 is therefore politely requested. As claims 15-24 are dependent upon the amended claim 14, applicant asserts that if claim 14 is found allowable, claims 15-24 should additionally be found allowable.

5 Reconsideration of the claims 15-24 is politely requested.

Applicant asserts that Lee et al do not teach a fuse structure as per the limitation disclosed in claim 25 of the claimed invention. The amended claim 25 recites a fuse structure including a substrate having a fuse area and a bonding pad area, a first dielectric 10 layer disposed on the substrate, at least a metal structure disposed in the first dielectric layer, a second dielectric layer disposed on the first dielectric layer and the metal structure, at least a first conductor and a second conductor disposed on the first dielectric layer, and at least a conductive plug disposed in the second dielectric layer for connecting the second conductor and the metal structure. Preferably, the first conductor having a first 15 thickness is utilized as a bonding pad and the second conductor having a second thickness smaller than the first thickness is utilized as a fuse.

Similar to the arguments made for claim 1, the metal layer structure disclosed by Lee et al does not include a conductive plug for connecting a fuse metal and a metal structure, such as a metal line. Inspection of Fig. 5C of Lee et al will reveal that the fuse metal pattern 50 is formed simultaneously with the adjacent via contacts 20, and no conductive plug is formed below the fuse metal 50 and within the insulating layer 15 for connecting the fuse metal pattern 50 and the metal 10. Hence, applicant asserts that the metal layer structure disclosed by Lee et al is significantly different from the fuse structure of the 20 claimed invention. Reconsideration of the amended claim 25 is therefore politely requested. As claims 26-35 are dependent upon the amended claim 25, applicant asserts that if claim 25 is found allowable, claims 26-35 should additionally be found allowable. Reconsideration of the claims 26-35 is politely requested.

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Applicant asserts that Lee et al do not teach a fuse structure as per the limitation disclosed in claim 36 of the claimed invention. The amended claim 36 recites a fuse structure having a substrate, a first dielectric layer disposed on the substrate, at least a metal structure disposed in the first dielectric layer, a second dielectric layer disposed on the first dielectric layer and the metal structure, at least a fuse having a thin portion and a thick portion on the second dielectric layer and in the fuse area, at least a conductive plug disposed in the second dielectric layer for connecting the fuse and the metal structure, a third dielectric layer on the second dielectric layer that covers the thick portion, and a first opening in the third dielectric layer for exposing the thin portion.

Similar to the arguments made for claim 1, the metal layer structure disclosed by Lee et al does not include a conductive plug for connecting a fuse metal and a metal structure, such as a metal line. Inspection of Fig. 5C of Lee et al will reveal that the fuse metal pattern 50 is formed simultaneously with the adjacent via contacts 20, and no conductive plug is formed below the fuse metal 50 and within the insulating layer 15 for connecting the fuse metal pattern 50 and the metal 10. Hence, applicant asserts that the metal layer structure disclosed by Lee et al is significantly different from the fuse structure of the claimed invention. Reconsideration of the amended claim 36 is therefore politely requested. As claims 37-46 are dependent upon the amended claim 36, applicant asserts that if claim 36 is found allowable, claims 37-46 should additionally be found allowable. Reconsideration of the claims 37-46 is politely requested.

Applicant asserts that Lee et al do not teach a metal layer structure as per the limitation disclosed in claim 47 of the claimed invention. The amended claim 47 recites a metal layer structure having a substrate, a first dielectric layer disposed on the substrate, at least a metal structure disposed in the first dielectric layer, a second dielectric layer disposed on the first dielectric layer and the metal structure, at least a first conductor and

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a second conductor on the first dielectric layer, and at least a conductive plug disposed in the second dielectric layer for connecting the second conductor and the metal structure. Preferably, the first conductor having a first thickness is composed of a first material, and the second conductor having a second thickness different from the first thickness is composed of a second material.

Similar to the arguments made for claim 1, the metal layer structure disclosed by Lee et al does not include a conductive plug for connecting a fuse metal and a metal structure, such as a metal line. Inspection of Fig. 5C of Lee et al will reveal that the fuse metal pattern 50 is formed simultaneously with the adjacent via contacts 20, and no conductive plug is formed below the fuse metal 50 and within the insulating layer 15 for connecting the fuse metal pattern 50 and the metal 10. Hence, applicant asserts that the metal layer structure disclosed by Lee et al is significantly different from the metal layer structure of the claimed invention. Reconsideration of the amended claim 47 is therefore politely requested. As claims 48-57 are dependent upon the amended claim 47, applicant asserts that if claim 47 is found allowable, claims 48-57 should additionally be found allowable. Reconsideration of the claims 48-57 is politely requested.

20 New Claims 58-62

Dependent claims 58-62 have been added to further describe the material used for the first conductor and the second conductor of the metal layer structure of the claimed invention. No new matter is added in the above claims and all claims are fully supported in the original disclosure.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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Sincerely yours,

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